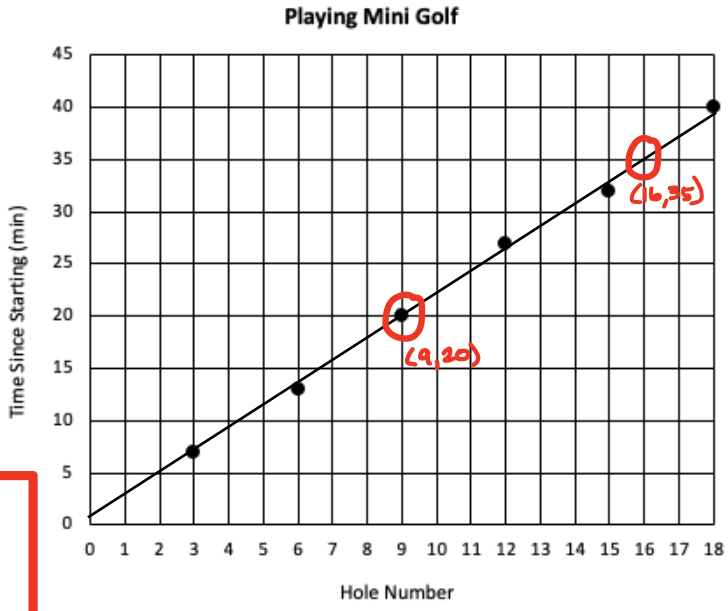
Name Key Period _____ Date _____

Using A Line of Best Fit to Make Estimates

Mini Golf:

Jamal and Alisha played a round of miniature golf. They made some notes of the time it took them to play. Their data are plotted in the graph below:



A line of best fit is already drawn. Pick 2 points on the line, and write the equation for the line of best fit in slope-intercept form (y = mx + b).

$y = \frac{15}{7}x + b$

$20 = \frac{15}{7}(9) + b$

$20 = \frac{135}{7} + b$

$\frac{140}{7} = \frac{135}{7} + b$

$-\frac{135}{7} \quad -\frac{135}{7}$

$\frac{5}{7} = b$

(9, 20) (16, 35) $+7 \quad +15$

$\frac{\Delta y}{\Delta x} = \frac{15}{7}$

$y = \frac{15}{7}x + \frac{5}{7}$

time (min) hole #

What is the slope of your line? What does this number tell us about playing mini golf?

$\frac{\Delta y}{\Delta x} = \frac{15 \text{ min.}}{7 \text{ hole \#}}$

It takes 15 minutes to complete 7 holes.

OR

2.1 minutes/hole

$\frac{15}{7} = 2.1$

The following questions can be answered using your equation.

1. Estimate the time it took Jamal and Alisha to play the first 7 holes.

$y = \frac{15}{7}x + \frac{5}{7}$

$y = \frac{15}{7}(7) + \frac{5}{7}$

$y = 15 + \frac{5}{7}$

$y = 15\frac{5}{7}$

It will take almost 16 minutes to play the first 7 holes.

2. What hole would you estimate them to be on if they played for 35 minutes?

$y = \frac{15}{7}x + \frac{5}{7}$

$7\left[35 = \frac{15}{7}x + \frac{5}{7}\right]$

$245 = 15x + 5$

$-5 \quad -5$

$240 = 15x$

$\frac{240}{15} = \frac{15x}{15}$

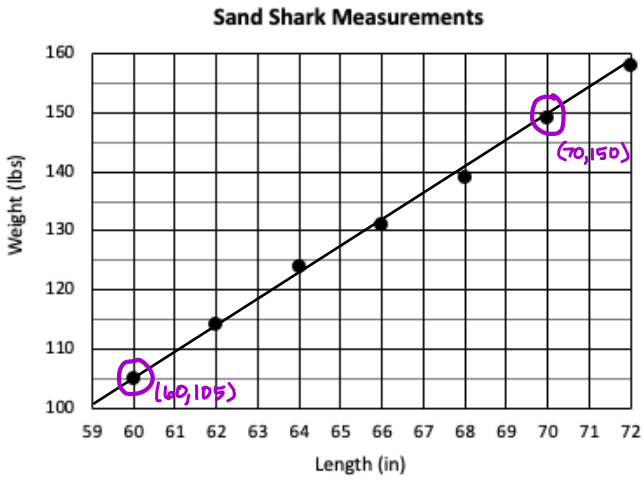
$16 = x$

If they played for 35 minutes they will be on hole 16.

Sand Sharks:

Lengths and corresponding ideal weights of sand sharks were collected and the data is plotted below.

A line of best fit is already drawn. Pick 2 points on the line, and write the equation for the line of best fit in slope-intercept form (y = mx + b).



(60, 105)
(70, 150)
+10, +45

$\frac{\Delta y}{\Delta x} = \frac{45}{10} = 4.5$

$y = 4.5x + b$

$105 = 4.5(60) + b$

$105 = 270 + b$

$-270 \quad -270$

$-165 = b$

$y = 4.5x - 165$

What is the slope of your line? What does this number tell us about the length and ideal weight for a sand shark?

$\frac{\Delta y}{\Delta x} = 4.5$

For every 1 inch in length the shark weighs 4.5 more pounds.

The following questions can be answered using your equation.

1. Predict the weight of a sand shark whose length is 75 inches.

$y = 4.5x - 165$

$y = 4.5(75) - 165$

$y = 172.5$

A 75 inch shark will weigh ~ 172.5 lbs.

2. If a shark weighs 150 pounds, how long would we expect it to be?

$y = 4.5x - 165$

$150 = 4.5x - 165$

$+165 \quad +165$

$315 = 4.5x$

$\frac{315}{4.5} = \frac{4.5x}{4.5}$

$70 = x$

You would expect a 150 lb. shark to be 70" long.